



DEPARTMENT OF FORESTRY & FIRE PROTECTION
OFFICE OF THE STATE FIRE MARSHAL
Flammability Standards for Building Insulation Materials
(AB 127) Working Group Meeting Notes
April 17, 2014
Office of the State Fire Marshal Headquarters
1131 S Street, Sacramento, CA 95811



CHAIRPERSON PRESENT:

Kevin Reinertson, Division Chief- Office of the State Fire Marshal (SFM) Code Development & Analysis Division

MEMBERS PRESENT:

Eric Banks, Technical Specialist- BASF Corporation, representing the Spray Foam Coalition of the Center for the Polyurethanes Industry (CPI)
Jesse Beitel, Sr. Scientist / Principal- Hughes Associates, representing the American Chemistry Council (ACC)
George Combs, Senior Principal Scientist, Product Development and Technical Support, Rigid/Specialties and Raw Materials, Polyurethanes, Bayer Material Science LLC
Rian Evitt, Code Compliance Officer- San Ramon Valley Fire Protection District, representing the Northern California Fire Prevention Officers Association (NorCal FPO)
Steve Fischer, Ph.D. Chemist- Department of Consumer Affairs, Bureau of Electronic and Appliance Repair, Home Furnishings and Thermal Insulation (BEARHFTI)
Andrew Henning, Deputy State Fire Marshal- Office of the State Fire Marshal (SFM) Code Development & Analysis Division
Marcelo M. Hirschler, President & Technical Director- GBH International, representing the American Chemistry Council's North American Flame Retardant Alliance (NAFRA)
Tonya Hoover, State Fire Marshal- Office of the State Fire Marshal (SFM)
Howard Hopper, Regulatory Services Program Manager- Underwriters Laboratories (UL)
Avery Lindeman, Science & Policy Associate- Green Science Policy Institute
Donald Lucas, PH.D., Combustion Scientist- Environmental Energy Technologies Division- Lawrence Berkeley National Laboratory
Walter Reiter, Deputy Director- Expanded Polystyrene (EPS) Industry Alliance
Mike Richwine, Assistant State Fire Marshal- Office of the State Fire Marshal (SFM)
Adria Smith, Deputy Fire Marshal- Fountain Valley Fire Department, representing Cal Chiefs / SoCal Fire Prevention Officers Association
Paul Wermer, Principal- Paul Wermer Sustainability Consulting, representing the U.S. Green Building Council of California (USGBC)
Kevin White, CPAT Director- California Professional Firefighters

MEMBERS ON THE TELEPHONE:

Dr. Vyto Babrauskas, President- Fire Science and Technology, Inc.
James Carver, Fire Marshal- El Segundo Fire Department, Fire Prevention Division
Gene Gantt, Interim Executive Director- CA State Firefighters' Association (CSFA)
Christina Guthrie, Program Analyst- United States Environmental Protection Agency, Pollution
Richard Lam, Ph.D., Staff Toxicologist- California Environmental Protection Agency (Cal EPA), Office of Environmental Health Hazard Assessment

Judy Levin- Center for Environmental Health
Ernie Pacheco, District 9 Environmental Programs Coordinator- Communication Workers of America
Robert Raymer, P.E., Senior Engineer /Technical Director- California Building Industry
Association (CBIA)
Steve Risotto, Senior Director, Phthalate Esters- American Chemistry Council (ACC)
Veena Singla, Staff Scientist- Health Program, Natural Resources Defense Council (NRDC)
Tony Stefani, SF Firefighters' Cancer Prevention Foundation

GUESTS/SUBSTITUTES PRESENT:

Bennett J. (B.J.) Yendrey, Fire Suppression Captain- San Jose Fire Department

I. CALL TO ORDER

Welcome / Self Introductions: Chief Kevin Reinertson called the meeting to order at 1000 hours and the participating working group members introduced themselves.

II. REVIEW/APPROVE MARCH 20, 2014 MEETING NOTES

Chief Richwine asked Chief Reinertson to explain the purpose of the strikeouts on page three. Chief Reinertson responded that he had attempted to minimize the length of the verbatim notes and inadvertently left the strikeouts in the document. A workgroup member pointed out that the last word on page four ("hasent") is misspelled; it should be "hasn't". Also, the reference to CFC-11 "glowing agents" in the first paragraph on page 12 is incorrect- it should be "blowing agents". Chief Reinertson advised that the notes are not approved and asked the workgroup members to email him any additional edifications by April 25th. He will resend the edited notes to the workgroup members for final review at the next meeting.

III. WORKING GROUP SCOPE AND DIRECTION

State Fire Marshal Chief Tonya Hoover thanked all of the members for participating in the AB 127 Working Group, acknowledged the fact that it's an extremely time-consuming process and expressed her appreciation to the members for remaining on board because the topic is very important. Chief Hoover then assured the workgroup members that the letters that were written to SFM were all thoroughly read and discussed; she takes every comment and concern very seriously and wants to ensure that the process remains open and balanced. SFM is not giving any one entity or industry a special voice or consideration above or beyond any other entity or industry; this is an equal playing field. If there are twelve fire service personnel in the room, then they do not have twelve times the voice. Chief Hoover clarified that SFM's primary interest is in fire and panic safety; she wants to ensure that the necessary public safety requirements can be met. Any blog or publication that insinuates that SFM can be bought or funded in a manner that's contrary to the mission is false and Chief Hoover takes such statements personally. Chief Hoover hopes that all parties participating in this group will speak up about any topic that he/she thinks needs to be addressed, disclose their affiliation(s) and be a part of the discussions and information sharing process. She does not want anyone to sit in silence and then throw stones at each other for what the workgroup is trying to accomplish nor does she want the workgroup's efforts to be misinterpreted or misrepresented.

Chief Hoover stated that everybody can recognize that E84 is not the best test for all construction circumstances; construction techniques and products and fixed protection have evolved over the life of the code development. There could very well be other construction alternatives that provide the necessary level of fire safety without using E84 to determine if fire safety provisions will be met. Chief Hoover requested that the workgroup develop the recommended alternatives to achieve the needed fire safety which could include construction methods that build assemblies with barriers, fixed protection systems and/or the

limited introduction of items in areas such as walls, floors and ceilings and ceiling openings to limit the introduction of air, fire and smoke into those spaces. Chief Hoover is looking for alternatives to E84; it does not have to be used/mandated- what are the alternatives? There may be a need to perform some assembly testing to draw some conclusions that could be recognized in the code as alternatives. California has the ability to create alternatives; the workgroup is comprised of scientists and PhD's who are the subject matter experts and know best. There could be a proposal to develop a more appropriate test; it's Chief Hoover's hope that the workgroup will include such a proposal in the recommendation report.

Chief Hoover received a letter from the bill's author that provides a complete explanation of her intent with a narrowed scope of direction and supports alternatives to E84 for the code. Also, SFM is trying to obtain funding for this project through the governor's budget process but will not know if it's approved until 7/1/14. Chief Hoover hopes that the request for funding will be included in the 2014-15 budget. Chief Hoover believes that SFM can stay focused on the mission of maintaining fire and panic safety while addressing possible acceptable alternatives for a modern construction world.

Chief Hoover then asked the workgroup if anybody had any questions;

Don Lucas asked her if AB127 calls for SFM in consultation with BEARHFTI to not only look at the building codes but also to consider safety, then are the potential health effects of toxic materials to firefighters and first responders included in the definition of "fire safety"? Dr. Lucas pointed out that material toxicology does not involve flames/burning thus he doesn't know if it would be considered a "fire safety" issue. Chief Hoover responded that she is concerned about firefighter safety and will take it into consideration but she thinks that the workgroup has the ability to use alternatives to look at the situation holistically.

Ernie Pacheco stated that members of his organization, Communication Workers of America, are exposed to fire-retardant toxins daily and are concerned about the health effects and he asked Chief Hoover if the two-month timeline to develop an alternative test(s) is still in effect. Chief Hoover responded that the timeline is based on the bill's/statute's timeline and SFM's ability to move rulemaking forward. If an alternative is introduced, then SFM has to follow a process to get it into the rulemaking process which is set by the building standards.

Steve Risotto (ACC) asked Chief Hoover if the (at least) two letters that she's referenced are going to be made available to the workgroup members; it was suggested during the last meeting that one of the letters would be distributed with the agenda for today's meeting but it wasn't included. Chief Hoover responded that she had not mentioned exactly how many letters she had received but she did receive more than two letters and she needs to verify with Cal Fire's Legal Department how the release of information is supposed to occur before she releases the letters. Chief Hoover wants to be open and collaborative and she promised to research whether or not it's legally permissive to distribute the letters to the workgroup members. Steve Risotto stated that it seems to him that the letters have caused a significant restatement of the task and are critically important. Chief Hoover responded that the letters that she received did not change the direction of the workgroup and the letter from the author of the bill clearly summarized her intent.

Marcelo Hirschler stated that he understands that the author's original intent is not reflected in the bill and he asked if the workgroup should focus on her original intent or what the legislature approved. Chief Hoover responded that she just gave the workgroup direction regarding what she wants.

Walter Reiter (EPS Industry Alliance) asked Chief Hoover if she wants information on combustion toxicity and she replied that if it impacts the fire safety provisions then she does. Walter then asked Chief Hoover if she thinks that combustion toxicity impacts fire safety provisions and she responded that it does impact firefighter safety. Walter then asked if the workgroup should consider the exposure to the

materials that are just sitting in the building and Chief Hoover responded that falls outside of the fire safety provisions.

B.J. Yendrey (SJFD) then asked if toxic byproducts that firefighters absorb during the fire suppression effort should be included in the workgroup's considerations and Chief Hoover responded that yes, the firefighter safety component is part of the discussion as it relates to the fire scenario.

Chief Hoover then reiterated that no one group will have a larger voice than any other group in the workgroup's recommendation process. The workgroup has the ability to move alternatives to the E84 test; the members are the subject matter experts who know what the alternatives could be. Howard Hopper (UL) asked if the group does not achieve consensus in preparing the report but does come up with well-developed recommendations on the same issue by different sides, then how does she want the workgroup to proceed? Chief Hoover responded that she would like all sides to be included in the report as part of the balanced approach that will give her the opportunity to read everybody's input and make decisions based on all of the information.

IV. PRESENTATIONS

A. **Dr. Vyto Babrauskas (Fire Science and Technology, Inc.): "Flame Retardants in Building Insulation: A Case for Re-Evaluating Building Codes"**

Dr. Babrauskas opened his presentation with a statement regarding the fact that much of the emphasis for AB 127 originated due to the findings contained in his paper titled "Flame Retardants in Building Insulation: A Case for Re-Evaluating Building Codes" that he co-wrote and published in *Building Research and Information*, a peer-reviewed scientific journal concerning building technology. The authors completed a thorough assessment of the fire safety aspects and the health aspects of the building code situation in America and specifically in the International Codes (which is what the California Building Code is based upon). Dr. Babrauskas and his colleagues wrote the paper because they realized that there is no fire safety benefit to adding noxious chemicals to insulation foams. The paper lays down the history of chemical additions to foam insulation which is rather complicated and convoluted and not particularly rational. The Uniform Building Code, which is the predecessor to the International Building Code, initially introduced the E84 requirement for many materials including foam plastics and the requirement remained until the mid-1970's when a number of people became alarmed regarding what happens when the foams are ignited in an open, exposed configuration. People were building unfinished rooms with no wall boards but rather foam only which made them uninhabitable and resulted in fires. The Uniform Building Code responded to the situation in 1976 by creating a special provision known as the thermal barrier provision which states that it's acceptable to use these materials if they are placed behind a thermal barrier. A lapse occurred when the 1960's Steiner Tunnel testing requirement was never reexamined when it should have been.

Factory Mutual (FM) research corporation issued a bulletin stating specifically that it's entirely inappropriate to perform the Steiner Tunnel test on homes because the results are meaningless. A specific test program to back up the statement was never published by FM but other institutions did undertake test programs and published their results. Underwriters Laboratories (UL) was at the forefront, as well as the National Research Council of Canada and the National Bureau of Standards (Dr. Babrauskas' former employer). The data was all analyzed to address the question regarding whether or not there's a fire safety value to the Steiner Tunnel ratings when applied to foams and the

answer is “no” which is clearly stated in the paper. Testing records from all three institutions indicate the same thing; a low number in the flame spread index provides no assurance that the same could be used in an open, exposed manner.

Another issue that Dr. Babrauskas and his colleagues addressed in their paper is the cavity spaces themselves. Is there a specific hazard that needs to be considered when the materials are in a stud-space type of environment? The National Research Council of Canada took the lead in studying the situation and discovered that if there’s not effective firestopping at the floor line then there’s a potential for all sorts of fire propagation which would otherwise not exist. The National Research Council also discovered that in some cases foam materials should not be placed in cavity spaces that extend from wall to wall, for instance a six inch cavity that’s filled with a four inch foam. The situation was studied and it was discovered that fire spread can occur within cavity spaces under two circumstances: if there’s an impropriety in firestopping at the floor line level and, if in addition to that, there’s a gap of one inch or greater between the foam and the wall. In addition, it was discovered that propagation for gaps bigger than one inch and without firestopping occurred irrespective of the Steiner Tunnel ratings which was pertinent to the E84 situation.

An additional issue that was explored was that if the Steiner Tunnel test is a faulty test when applied to foam plastics, then is there a better test that should be proposed that would adequately do the job? It was found that there is no alternative to the Steiner Tunnel test because it’s logically untenable in that if there’s a large scale test that’s realistic, then the materials will fail if they’re foams of the type and quality that are used for commercial and /or residential thermal insulation. The researchers found that the question should not be how to come up with a better test but rather how to come up with different measures of protection. The fifteen minute thermal barrier should be utilized during the majority of the time because it’s a good, acceptable solution for life safety purposes. Dr. Babrauskas thinks that the workgroup should examine whether or not existing firestopping provisions are adequate because the research results showed that failure was due to inadequate firestopping.

Jess Beitel (Hughes Associates representing ACC) asked Dr. Babrauskas if the Canadian studies referenced the E84 ratings on the foams that they used; Dr. Babrauskas responded that the Canadian studies have their own tests that are similar to the E84 but the numbers don’t match / are not identical. Jess then stated that foams are in use today that don’t need a thermal barrier and that pass a full scale room corner test (the NFPA 286 or UL 1750) but those types of foams require the use of some types of fire retardants in order to pass the test.

Marcelo Hirschler stated that there are polyimide foams that are not normally sold in the commercial environment that exist and that will pass the test without flame retardants. When this topic was discussed at the National Code Hearings, FM Global representatives were strongly opposed to the recommendations because they thought that additional protection for foam is essential. So, whatever FM Global may have indicated as their position earlier is not their position today. Marcelo Hirschler explained that when the RB 163 proposal to eliminate the requirement to test for ASTM E84 from foam placed behind the thermal barrier was introduced, JC Harrington of FM Global spoke in opposition to it. Marcelo Hirschler strongly supports the existence of some type of fire test; it doesn’t have to be E84- just a test. The thermal barrier is not gypsum; it can be, but it isn’t always, and the thermal barrier needs to protect for fifteen minutes. Fires today are so much hotter and there’s so much more energy coming from the contents than when the ASTM E119 curve was originally developed that going backwards and decreasing fire safety requirements will not accomplish what the bill requires which is to maintain fire safety. Chief Reinertson advised that if there’s a proposal (which he thinks that there is based on some of the materials provided), then does

it need to be more restrictive or have more bells and whistles added; that's a discussion for the workgroup to work through as the proposals begin to develop.

George Combs (Bayer MaterialScience LLC) asked Dr. Babrauskas to clarify his reference to figure 5 and the range of tests for NRC, NVS and UL; the flame spread index and time to flashover are on the axis and he wants to clarify that the heat source and configuration of the rooms is very critical in determining the outcome of any kind of test. The chart contains a number of different heat ignition sources and configurations that imply only flame spread index and time to flashover are changing which is not the case and leads to erroneous conclusions. Most of the tests referred to are pre-date changes in the ASTM E84 Tunnel method itself for mitering flame spread index; there were critical adaptations made after 1976. There have been many tests developed post 1976 that could be referenced during discussions regarding the impact of the configuration of the room being used on the burning susceptibility of foam insulation. Dr. Babrauskas responded that it's not a reasonable argument to state that the E84 test has been revised a number of times over the years which has resulted in making foam something that's acceptable to test by the E84 test method and he challenges anybody to show him data that contradicts the data that he assembled; he doesn't think that it exists. Paul Wermer (USGBC) stated that there have been so many revisions to E84 and it's been so improved that when someone speaks specifically about where E84 fails to deal well with polymers, he/she needs to state specifically what changes have been made to improve the performance of testing of polymers with respect to the identified failure modes. George clarified that the chart, as it's configured, does not actually represent what it says that it represents. All organic materials are combustible and under some set of conditions, any organic material is going to burst into flames. It's true that there have been many changes to E84 but regardless of the changes, wood and foam plastic would burn when placed in certain room configurations with certain heat ignition sources so George would like to emphasize that it's necessary to be careful to clearly specify the heat ignition source and geometry when discussing foam plastic performance.

Tony Stefani (SF Firefighters' Cancer Prevention Foundation) stated that on behalf of the Board of Directors and the firefighters of Local 798, he wants to express his deep concerns about the standard of flame retardant chemicals in building insulation. The firefighters take the brunt of the toxic exposures after fires have been extinguished when they're going through the overhaul process. Although firefighters wear personal protective equipment (PPE), it was proven by the CDC in a case study done in 2008 that the chemicals have the ability to permeate some of the PPE. There was also a pilot study done that was published in Chemosphere last year that examined twelve S.F. firefighters where blood levels were drawn and the serum was spun out; all of the firefighters had high levels of decabromodiphenyl ether (decaBDE) in their blood- 60% higher than the general population and 30% higher than the citizens of California. The bio cumulative effect of the toxins that are being placed in the insulation in walls raises the red flag very high for firefighters; it's not something that will leave their systems in a day or two but rather something that persists and accumulates and it's not known how serious the effect will be. A recently published NIOSH study advised that 151 S.F. firefighters have passed away due to cancer since 2009 which is 32% of the total amount of firefighter deaths during that time period. That number does not take into consideration the firefighters who contracted cancer, still have it / are fighting it and are surviving. We're close to having one in two retired firefighters contract cancer; something needs to change and Tony thinks that this is the platform to start making changes.

Ernie Pacheco (Communication Workers of America) mentioned that although communication workers' exposure to toxic chemicals isn't as high as the firefighters' exposure, it is an issue and he thinks that it should be part of the discussion. Chief Reinertson advised that Ernie's concerns were discussed at the legislative level during the bill's signage and the charge does include reviewing flammability standards for all building insulation materials which includes those that exist in

communication workers' environment. Ernie stated that he's confounded by the idea that flame retardants are going to be used in insulation for new and major high-rise construction in S.F. when there's a requirement for a 5/8" dry wall on both sides that provides a one-hour protective barrier.

B. Paul Wermer's Presentation on the Steiner Tunnel Test

Paul thinks that the workgroup's process must start with the Steiner Tunnel test in any of its infinite variety of standards numbers. The Steiner Tunnel test is totally independent of the use conditions, the room configuration where the material is used and the heat release of combustible objects that may be in a room during a fire condition. There are some contested issues; it's not clear how reliably it predicts performance in a building fire, especially for polymer foams, and it's totally unclear whether the methods, accuracy and precision support its application or claimed benefits. If the material passes the E84 criteria, then additional tests are required for a number of applications which include E119 or any one of the multitude of alternative code numbers looking for its uses in insulation and wall or partition assemblies, DASHMA 107 for garage doors or E108 to look at exterior fire challenges when it's used in a roof structure.

The workgroup should evaluate how materials are used in current assemblies. NFPA 268 addresses exterior walls; what's being looked at is how does that wall respond to a thermal challenge that can ignite the wall? Determining the ignitability of a wall describes the challenge under the scope. It makes the point that the method shall not be used to evaluate the fire resistance of wall assemblies in the interior and it's unclear why it's there; is there a serious technical problem or did the group that developed the test decide not to determine how it might apply to interior walls? The ignitability is the propensity of the assembly to ignite and burn. Since we're concerned about combustible materials in terms of all of these foams, flame retardant or not, behind the thermal barrier, isn't the ignitability of the wall assembly the key indicator that the workgroup should be examining?

Alternatively, E119 or UL263 discusses using it to look at wall partitions and roof test specimens but it doesn't talk about ignitability or thermal barrier failure. There's a test method with a challenge of modifying sections to specifically address time to thermal barrier failure and time to ignition which might provide a good assembly test looking at the material as it's used in today's construction environment. There's potentially been a modified 286, essentially a corner test that Marcelo Hirschler alluded to in his Fire Protection Engineering article years ago; using the corner test to look at foams and some would pass if they were specially designed. If done with a thermal barrier, does the corner test provide adequate information? There are a host of other tests that exist that may be worth examining but these tests jumped out at Paul because they're already standard tests with fairly straightforward modifications and they could help steer the workgroup in the right direction. Perhaps using a pour scale method might lower the costs of testing structures. Also, there's a whole host of test methods going on in the EU that the workgroup might be able to utilize. Paul stated that he thinks that assembly tests behind the thermal barrier are absolutely necessary and he agrees with Marcelo Hirschler that if the thermal barrier doesn't do its job correctly then the 275 is not necessarily a sufficient test. The assembly test is an important validation as Jess discussed; there are different failure mechanisms that occur under fire conditions with foams behind a barrier which may lead to tracking or other problems.

Marcelo Hirschler responded that ASTM E119 deals with reaction to fire- not protecting the room from penetration to another room; that's irrelevant. NFPA 275 includes two tests- both conducted with the thermal barrier and the foam behind it. One is a modified small-scale ASTM E119 for fifteen minutes- not an hour- and the test is an assembly test and the other test is NFPA 286 although there are other options which are more severe but NFPA 286 with the appropriate criteria. There are problems if beyond that the foam itself is not also protected. Paul Wermer pointed out that the

ASTM E119 makes the point that there needs to be a properly designed assembly that reflects the use conditions. Paul is not stating that ASTM E119 should be implemented exactly as written and Marcelo Hirschler stated that it's not relevant.

Jess Beitel asked Paul to return to his first slide and go over his presentation again. Jess stated that E84 measures materials for tests that are independent of use conditions and that cover for every place in the building code where this is used. So, all interior finish materials- wall coverings are tested in a horizontal application independent of the use condition and it doesn't address other combustibles that may be in the room. E84 is not the most perfect test but it does indicate that if it's really bad, then don't go there. The flame spread must be controlled for the foam industry to be less than wood which is Class C. If a material passes E84 then what other tests are required?

Paul Wermer stated that E84 results can be misleading because there can be a low E84 but it's unknown how the material will perform if there's a fire in the cavity. Jess stated that there is no test to evaluate in-cavity ignitions of any material, whether it be foam, cellulose or some other material. Paul spoke again about 127; where are the conditions where an alternative to the E84 requirement can be established? However in a case where there's thermal barrier right up against the foam as it is in 90+ % of residential construction where they use foam, that situation doesn't apply. So a requirement is being added that drives the formulation in a way that it might not need to be driven.

Paul responded that according to the data that's been presented, there's no evidence that an E84-certified foam with marginal fire performance in the use orientation in the wall performs any better or any worse than a foam that's not flame retardant; that's the purpose of getting the assembly test in place that accurately represents the wall structures that are being approved. Jess responded that he would like to see the test data because the point must be proven.

E119 is a test that's used to prevent fire from moving from one portion of a building to another portion of a building. The test was initially designed without taking surface burning into consideration; the test looks at what happens on the unexposed side of the wall or the floor. People who work on Fire Protection Engineering or run special tests will try to generate additional data to obtain clues but it's not typically reported. The only place where some of the data is seen is in a combustible assembly, typically walls, in UL's fire-resistance design book where they will measure a finish rating (the temperature between the gypsum board and the wood stud) when they have gypsum board as the front face exposed to the fire. Typically for 5/8 type X gypsum and an E119 test it's somewhere around 25 minutes depending on the manufacturer. Jess continued to opine that while E119 is a curve that was developed in 1914 that everybody uses to compare against the same rule, in today's world- especially in some of the houses- E119 doesn't apply. 2000 degrees is achieved in approximately three minutes and in some cases it burns very vigorously and then drops off. 5/8 type X gypsum wall board will be violated in approximately five minutes under those types of exposure conditions. E119 is a standard test but it doesn't compare to real life; it doesn't address burning of the materials. There are assembly tests for many of the applications but not all of them; the addition of fire retardants will be necessary for any of the foams to pass most of the tests.

Jess thinks that foams were required to be listed and labeled so that people would know what the formulations are and the main reason for doing that was because of its flammability in E84 and in real life. When somebody had a foam that was really bad in real life, they went back and reformulated it- added FR's or something else. What's the quality control procedure for the new formulation? How can anybody in the real world know that a foam that showed up on their job site is good or bad? That's why listing and labeling became a requirement.

Paul stated that he would love to see the data that supports the use of E84 demonstrating that it actually has the resolution to detect changes in formulation or manufacturing processes out of control. Paul has asked what the method quality is and he's been stonewalled. Chief Reinertson asked the industry representatives in the workgroup if it would be possible to provide the E84 data that Paul has requested. Walter Reiter (EPS Industry Alliance) requested that Paul define the term "process control". Paul responded that a basic problem in the manufacturing process is that someone changes a recipe, either intentionally or inadvertently, a raw material comes in and it's different than expected which wasn't caught. There are a series of tests and controls in the process that says is everything going as it should or has something drifted? There is an E84 test that Paul has been told is used as a process quality control and unless there's adequate data to show that it's as good as the standard tests that any manufacturing plant uses, then a test is being run that gives a false sense of security because it's not measuring what it purports to measure. Walter Reiter (EPS Industry Alliance) sees what's monitored when he's in plants and knows that the industry is in the middle of a transition and he knows that manufacturers are going through a whole lot of testing and E84 is one that they use to see if they can hit the flame spread and smoke generation index.

Avery Lindeman (Green Science Policy Institute) stated that even if ASTM E84 is not required in the code, manufacturers could still use the test if they want to; nobody is suggesting that manufacturers are not allowed to run that test.

Howard Hopper (UL) advised that Paul Wermer had contacted him and asked four very specific questions about E84 and it's reproducibility, the variations between labs and issues that went very much straight to the heart of the E84 standard. Although UL is a certification organization that conducts testing, their response was that Paul's questions should be directed to the ASTM E84 Committee. The UL representatives could have answered his questions regarding the variations between UL and other labs but they didn't think that they were the appropriate entity to respond to Paul's very specific questions.

George Combs (Bayer MaterialScience LLC) stated that some of the test results that were referenced in Vyto's article show different grades of foam- Class A or other types of ratings- and how they perform in various room corner tests. Marcelo Hirschler has referred to the European standards that also use the category performance rankings of the foams in these types of tests. So, there's a lot of data that shows how foams behave when they perform in a certain classification or category ranking with regard to E84. ASTM has also published papers through a task group that they set up to deal with performance in the tunnel. George advised that the data is available, even in Vyto's references- they mention what the heat ignition sources were, how the faced or unfaced foam performed, etc. George does not understand Paul's questions / what he's looking for. Paul responded that Vyto's data is reporting the results of a test that was done and although Paul has not read all of Vyto's references in infinite detail, he questions the analytical test method's ability.

Chief Reinertson advised the workgroup that too much time has been spent discussing E84. A proposal is developing between Vyto's information that he provided in his presentation and Paul's information and ideas regarding an assembly. Chief Reinertson directed the workgroup to start working on that alternative to what's required in 720.1. The workgroup is not throwing E84 out the door but is rather working on developing an alternative whether it's a barrier, an assembly, a requirement for twenty pounds per square inch of firestopping material, ESFR heads in residential occupancies- the workgroup must move forward with developing an alternative(s) after the lunch break and stop discussing E84.

LUNCH BREAK 11:45 AM– 1:00 PM

Chief Reinertson reconvened the meeting and advised that he sent out an email to the workgroup members during his lunch break that contains the letters of concern and the letter from Assembly Member Skinner's office; he also disbursed hard copies of the letters to the workgroup members who were physically present at the meeting.

IV. PRESENTATIONS (CONTINUED)

B. Paul Wermer's Presentation on the Steiner Tunnel Test (Continued)

Jess Beitel advised the workgroup that the industry has always required the E84 test for foam plastic insulation. Assembly testing has been used for many materials over the years and many exceptions have been allowed to occur without additional testing because the foam's performance and how it's applied had always demonstrated superiority in the past. If the requirement for the E84 test is removed, then all of the other tests will have to be examined in some form or fashion. Jess suggested that the workgroup develop a flowchart showing what additional actions will have to be taken if the E84 requirement is removed. Both commercial and residential codes will have an impact on the actions that will need to be taken.

Chief Reinertson advised that the workgroup should focus on one thing: a wall for a single family dwelling, duplexes, triplexes (R3's) and it could expand and apply to R2 occupancies: apartments, hotels, etc. and then into commercial structures and high-rise buildings. During the first two meetings, the workgroup discussed their sphere of influence and what they can achieve. The recommendation(s) could be beyond the scope of this workgroup and could be that the State Fire Marshal take action during the next rulemaking cycle or at the next National Code Hearings or when ASTM develops something; the world is big as far as what SFM can do. Chief Reinertson does not want to limit what occupancies, types of construction or buildings that the workgroup can examine; the workgroup needs to start somewhere. One and two family dwellings and typical Type V construction do not require a lot of hourly ratings and may (or may not) be the easiest place to start the examination.

Marcelo Hirschler stated that there are two separate issues that are getting mixed up by the workgroup and that need to be separated; one is that there's already assembly testing in the Code. The thermal barrier is an assembly test that involves the thermal barrier and the foam behind it. The discussion regarding whether we're going to change to assembly testing is inappropriate because assembly testing has been taking place for approximately thirty years. The workgroup needs to ensure that the discussion goes in the right direction in properly identifying the debate; is it that flame retardants should not be added to foam or is it that the E84 test should be replaced with something else? Marcelo Hirschler would be perfectly happy replacing the E84 test with something else if the workgroup can find something else that will work in its place but he would not be happy with a decision stating that nothing beyond the assembly testing is necessary. As Paul pointed out, other tests are being used in Europe such as the SPI EN 13823. Chief Reinertson directed the workgroup to discuss the two items of concern to Dr. Hirschler.

George Combs inquired if Chief Hoover is asking the workgroup to develop alternatives to E84 itself as a test method by looking at ways where E84 as a performance requirement is the issue. Chief Reinertson clarified that Chief Hoover directed the workgroup to look to alternatives to what's in the CBSC which includes E84. Chief Hoover's discussion includes an assembly- a barrier. He

again described an extreme hypothetical assembly. Another recommendation could be that E84 needs to be revised in the way that it tests foam materials; or, a different standard needs to be created and the workgroup recommends that SFM seek funding and consulting with experts in the lab fields regarding how to develop the tests.

Paul is uncertain how testing materials actually relates to performance in building fire safety which to him is still vaguely defined. He fully understands that heat release rate is very important once the material has started burning but when discussing material within walls, the question becomes: is it likely to start burning? How does material testing determine anything about the performance of materials within walls when under fire conditions in ways that effect fire safety? He understands fire safety to mean that there's adequate time for someone to get out of a room and there's a reasonable expectation that fire personnel will be able to respond before it fails and creates a much greater problem for the first responders. If material testing doesn't help people understand anything about the performance of materials within walls when under fire conditions in ways that effect fire safety, then why spend time on a test? Chief Reinertson asked the workgroup to develop a real world example. Paul stated that updating the fire curve may be an appropriate thing to do.

Adria Smith (Fountain Valley FD) stated that one of her major concerns in preserving fire safety in addition to the firefighter health issue is ensuring that building collapse isn't being encouraged by not protecting materials and therefore burning hotter fires; there must be a metric to define that the barrier will perform the same and keep the same timeframes.

Paul Wermer stated that many of the standards that are being used today need to be updated because they're not capable of doing what they're intended to do because they're based on real-life performance data that was valid fifty years ago.

Chief Reinertson advised that there's a lot of work being done in that area but it hasn't come to fruition yet. Jess Beitel disagreed that the standards are no longer any good; true fire-rated assemblies go through E119 but they don't collapse rapidly. Collapses occur more frequently in non-rated types of systems that come down much quicker because of their lighter construction, etc. There has not been much information regarding post-fire conditions where true fire-rated systems have fallen down quickly; it's not a significant issue.

The workgroup discussed Chief Reinertson's hypothetical assembly. He compared a single family dwelling that does not require one-hour fire-rated construction to an E84-compliant foam wall and concluded that the wall that has the 5/8 type X is going to take more to construct and will be a bit more robust on one end. He then asked the workgroup to compare the two hypotheticals in a fire condition; is 5/8 type X gyp board on each side of the wall enough or should there be more? Jess Beitel responded that normally 5/8 type X would be substituted for 1/2" with a full cavity of foam, either FR treated or non-FR treated; it's an insulating material that's sitting in there more than an R13 fiberglass. So, it's unclear if there's enough time between the fifteen and twenty minute finish ratings; it might work but it might not work. Chief Reinertson advised that the workgroup has a short period of time to complete the work; that timeframe may be extended. He asked if any workgroup member is aware of any tests that have been performed on his hypothetical wall assembly that demonstrate its performance. Chief Reinertson asked the workgroup members whether or not any bells and whistles should be added to the home contained in his hypothetical assembly and he stated that he's only discussed a wall- not a floor assembly, an attic, a floor-ceiling assembly or what to do up in the attic. Marcelo Hirschler stated that something to assure that there's no confusion in the building site between the foam that's flame retardant and the foam that's not flame retardant needs to be added because that's a serious concern. Chief Reinertson stated that the same situation exists when there's rated gyp board vs. non-rated gyp board. This type of scenario could be

contained in the recommendation by stating that certain types of foam have to be labeled in such a manner as to identify every square inch on the foam board itself.

Chief Reinertson advised that one of the benefits of utilizing California's rulemaking methods as opposed to the National methods is that it's possible to make these kind of amendments and it's done often. For example, certain requirements were written into the Wildland Urban Interface (WUI) standards that weren't contained anywhere else and now they are everywhere else. Also, some of the fire alarm and solar photovoltaic requirements such as the marking of conduit on roofs were written into the California code.

George Combs inquired if Chief Reinertson's hypothetical assembly would apply to windows and special conditions for flames coming out of a window in two-story homes where people may be asleep. How should the workgroup address fire situations in homes where people are awakened by alarms? Flames going up the outside of commercial buildings are addressed by 285 but the Residential Code does not address such situations. Chief Reinertson responded that his hypothetical assembly addressed how that wall assembly behaved compared to the current types of walls that are utilized. The exception to complying with 720.1 of the building code (which is the part that requires E84 compliance) is a prescriptive thing that could get developed and put into the code. The floor-ceiling assembly scenario, horizontal vs. vertical surface, 1 and 1/8" plywood on top with two layers of 5/8 type X with solid foam sandwiched in; Chief Reinertson is trying to get something started for the workgroup to start exploring. It's ok if there's no way to demonstrate its viability and SFM needs to seek testing.

Howard Hopper stated that Chief Reinertson's hypothetical assembly could be put under the Recommendations section; the workgroup has pages and pages of studies and data and issues but no recommendations until now. Chief Reinertson responded that he's trying to push something forward by developing Paul Wermer's idea regarding the barrier that he proposed during the last meeting. Tina Guthrie (EPA) stated that perhaps it might be helpful to draw up rough sketches of different configurations and send out a poll to the workgroup members (including those not present) regarding which one(s) they think could be best utilized. Chief Reinertson responded that conducting a poll would not be productive in this situation due to the type of group setting that exists on this workgroup.

Bennett Yendrey advised that robust, vertical firestopping in between floors changes the tactical environment that he's working in as a fire captain; he has greater options. He asked the workgroup members to consider effluent gases when examining assembly testing. If assembly A is very close in performance to Assembly B but Assembly B emits gases that firefighters are essentially physiologically defenseless against due to their being encased in smoke and sweat, then he would prefer that Assembly A be utilized. Perhaps information regarding what's being emitted from the assemblies could be gathered if burn tests are conducted. Marcelo Hirschler stated that it's been demonstrated time and time again that the toxicity of soot and associated polynuclear aromatic hydrocarbons attached to the soot is larger by three or four orders in magnitude than the toxicity of the efferents from FR's. Bennett responded that he understands that many of the chemicals tend to bioaccumulate over a period of time and he'd like to minimize the amount of toxins that will enter firefighters' bodies. Chief Reinertson advised that Chief Hoover is steering the workgroup towards developing some type of assembly that doesn't contain FR's. It's not under the purview of the law for the workgroup to recommend studying such effects. There are already tests out there that address assemblies with FR chemicals.

V. LITERATURE REVIEW

VI. WORKING GROUP UPDATES/REVISIONS TO WORKING DRAFT

A. Recommendations:

Marcelo Hirschler stated that a problem with the working draft document is that some issues that have been discussed were not added to it. Chief Reinertson assured Marcelo Hirschler that his items of concern will be added to the working draft document. Paul Wermer stated that he would like to read the revisions and think about them on his own; a lot of group time is being spent trying to understand what's being said. Howard Hopper stated that many of the changes to the document will be editorial and can be moved forward without a huge debate. Items that require debate should be skipped. Chief Reinertson explained that items 1 and 2 address exactly what's in the bill. Howard explained that he added the wording from the bill into Appendix C. Chief Reinertson asked Howard to have Justin Malan read through the document and add specific comments. Chief Reinertson advised that the workgroup is dealing with the CBSC; the terms contained in the document are legally defined by statute. Howard made editorial changes to make the document more concise and he incorporated Tony Crimi's comments.

Marcelo Hirschler stated that in accordance with ASTM E176, "fire performance" is what happens in a real fire whereas the classification that results from a fire test is the test response. So, if the workgroup is following E176, then a specific fire test performance classification or fire rating terminology should be used- not "fire performance". Marcelo Hirschler advised that mineral wool, glass fiber and all of the concrete foams that he's familiar with failed the E136 non-combustible test; none of them are non-combustible and usually do not contain flame retardants. Howard edited the document accordingly.

Chief Reinertson asked the workgroup to brainstorm and come up with discussion points about what should be put in the recommendations portion of the report; is the benchmark too low or too high? Is a test achievable or not achievable? Does a material need to be tested or not? He asked Avery Lindeman, Donald Lucas and Paul Wermer to be the primary writers of this section and mentioned that he will also contribute substantial amounts of writing because he's very familiar with portions of this topic and the report-writing process in general.

Steve Risotto stated that in light of Chief Hoover's direction, it's important to include Assemblywoman Skinner's letter in the appendix of the report. Marcelo Hirschler stated that a significant item that hasn't yet been discussed is the part of the second to last paragraph on the first page of Assemblywoman Skinner's letter regarding changes in the building codes over the years that have resulted in specific building construction materials and practices that have in many cases increased building fire safety and thus may lessen the need for fire retardants. Marcelo Hirschler thinks that the workgroup's report should contain a section regarding the changes that have occurred since the insulation requirements were added to the code in the 1970's. Tina Guthrie suggested the increased use of smoke detectors and the requirement for 5/8" drywall as examples. Marcelo Hirschler added the current requirement for 3/4" plywood instead of drywall is a significant change. George Combs asked Chief Reinertson if he would like the workgroup members to look at specific parts of the residential code to make recommendations.

Chief Reinertson responded that after reviewing parts of Vyto's work and some of the information that Paul Wermer provided, he thinks that the hypothetical assembly example that he gave to the workgroup earlier during the meeting is a good starting point. If the workgroup wants

to start with 5/8" type X and 5/8" type X with non-flame retardant foam in the middle, it does not achieve a one-hour assembly; it takes two layers on each side, so four layers total. There is no specific test to use as a comparison. When considering a single-family dwelling, the typical construction is to put anything on the interior and exterior faces of the wall, whether it be 1/2" gypboard or even 3/16" gypsum wallboard. Chief Reinertson asked the group to create an assembly- not with an hourly rating- with 5/8" type X gypboard and 5/8" type X gypboard on the interior and exterior sides of the wall because they're more robust than just regular 1/2" gypboard. The exterior facing should consist of whatever materials the workgroup members would like to put on it to enhance the look of the home. Jess Beitel advised that according to the finish rating, which is the measurement of heat transfer through the gyp board itself, 1/2" gyp board has an approximately 15 minute rating and 5/8" type X has an approximately 22 minute rating. The assembly contains 2 x 8 construction. If it's determined through the process of future testing that the amount of foam inside is too much or the 2 x 8 construction will not work for this scenario, then those factors can be changed.

Paul Wermer asked what kind of challenge is going to be applied to the assembly. Marcelo Hirschler responded that it's been determined by default that the hypothetical assembly is safe irrespective of what's put inside. Paul Wermer responded that he isn't comfortable asserting that any assembly is safe without first testing it. Chief Reinertson advised that he was just trying to start the discussion. Marcelo Hirschler stated that one layer of 5/8" gypboard on both sides is lightweight construction; two layers would be better. Jess stated that he doesn't consider one layer of 5/8" gypboard on both sides of the wall to be lightweight construction; TJI's are lightweight construction but 2 x 4's, 2 x 6's, 2 x 8's are not lightweight construction. Chief Reinertson advised the workgroup that they will eventually have to consider one-coat stucco foam where there's 1" of foam, 3/8" of vinyl stucco and no thermal barrier.

The workgroup then discussed firestopping. Marcelo Hirschler pointed out that there's no requirement in the code that the penetrations of the thermal barrier not be firestopped. So, there can be as many penetrations as necessary in the thermal barrier (in a non-fire resistance rated assembly). E814 is the firestopping requirement in ASTM. Non-balloon type framing is another consideration. Fireblocking is not enough here; the firestopping will seal up the penetrations.

Tina Guthrie asked if a home has a sprinkler system then could FR's be skipped as part of new home construction? Jess responded that could be a problem because sprinklers are there only for life safety- not property- so they're supposed to be able to get people out quickly. Chief Reinertson advised that it's already mandated by the State of CA that new construction of one and two family dwellings includes sprinkler systems. The sprinkler provision was mandated specifically for life safety only; the systems that are installed in one or two family dwellings are very limited compared to what's found in a commercial type of structure or the ESFR (early suppression fast response) sprinklers. Andrew Henning stated that a 13 system can be installed instead of a 13R system which would address both life and property safety but would be a trade-off later. Chief Reinertson advised that systems that are installed in single family dwellings do not provide attic or concealed space protection; there isn't protection in every single room of the building. It's mainly for the living areas to get people out quickly. Marcelo Hirschler advised that sprinklers extinguish all fires but in roughly ten percent of the cases they don't work, either because they're not connected or the water is turned off or for some other reason. Chief Reinertson stated that a principle philosophy of Chief Hoover's and SFM is to never consider sprinkler trade-offs when proposing national code changes or when individuals propose code changes to SFM. Sprinklers are required for specific reasons and trade-offs at the national level have become a bad precedent. The State of California completed a huge study on sprinklers when the national codes were adopted in 2006-2007 and the higher-risk occupancies (assemblies,

educational, institutional and residential) were not afforded sprinkler trade-offs. The State of California has fought for thirty- plus years to get residential fire sprinklers into the code for new construction of one and two family dwellings for the specific purpose of enhancing life safety. The value that sprinklers add is enormous and unquantifiable. When construction methods are changed, the dynamics are changed and Chief Reinertson does not want to risk the adoption of residential fire sprinklers in California.

Chief Reinertson asked the workgroup to address electrical considerations. Do cables need to be placed in conduit or rated boxes? Marcelo Hirschler responded that it depends on what's put inside; if riser-rated cable is put in, then it should be ok. Riser-rated cable should be the minimum requirement; if it's not riser-rated, then metal conduit should be required. Chief Reinertson asked if when spray foam is injected into a wall cavity and provides a 100% seal, is that an issue? Eric Banks replied that if the surface is overloaded significantly such that the wire turns into a heating element, then there could be a potential problem but that's not the standard. Chief Reinertson asked if the workgroup would like to include steel or plastic rated boxes to the hypothetical assembly. Marcelo Hirschler responded that there's been an incredible amount of debate in the NEC when M cable was extended to three stories; he thinks that if M cable is added to the assembly then a recommendation to include conduit would be a good idea. Chief Reinertson explained that he addressed the wall cavity itself only in his assembly; he added any tests if necessary. He asked the workgroup if, based on what's known about how single family dwellings are currently constructed and how they perform, will the type of assembly that he created provide adequate time for building occupants to escape either a sprinklered or non-sprinklered building? Marcelo Hirschler stated that the question should be will it provide enough time for the occupant to leave before the foam gets involved. Chief Reinertson responded that his assembly is an example of an alternative to what's being constructed today. Will his alternative assembly achieve the same level of performance in evacuating building occupants as standard construction with thermal insulation and FR foam? Jess stated that the alternative assembly would pass a room corner test; there might be some cracks and ignition here and there right where the burners are but it would pass the test.

Chief Reinertson advised that there are a lot of questions that need to be added. The first question regarding occupant safety is does this type of assembly provide adequate protection for occupants to safely exit the building in a fire scenario? A second question, that will be more difficult to answer, is how does this assembly perform compared to current construction for firefighter safety? Many construction and code changes have occurred over the last ten years that have completely changed the dynamics of buildings: lightweight construction. Firefighters fall through roofs more often now than they did in the past. Is the alternative assembly going to worsen that scenario?

- B. Toxicity of Flame Retardants:** Walter Reiter stated that there's a lot of confusion regarding the different types of foams that are being discussed and which FR's are being used. The workgroup is not only concerned with combustion toxicity but it doesn't appear that health and environmental concerns are being balanced; the fact that urea formaldehyde resin (UFR) is commercially available now and has received glowing health and environmental numbers from the EPA means that it may no longer be relevant. Paul asked how Walter's statements relate to the chart contained in the working draft document. Walter clarified that if the workgroup is only discussing combustion toxicity and not health and environmental issues, then the exercise is being done without any concern regarding whether or not the statements regarding material toxicity are valid. Howard suggested accepting the section and adding a note about whether or not the whole section is still needed and later addressing it. Jess asked if the workgroup should

clearly state the assumptions that they're currently working under and those that they're no longer concerned with in the document. Walter advised that he would like to submit some pertinent language regarding the fact that the workgroup is no longer considering some of the original points that had been a basis for this entire activity and none of the recommendations will be based upon the validity of any of those assumptions. Chief Reinertson asked Walter to email him the aforementioned language.

Walter also added some comments to a paragraph in the working draft document that he thinks is misleading based on studies contained in Veena Singla's submissions. Two researchers, Desmond and Ebert, answer Veena's question regarding it being unknown how HBCD generates dioxins that contribute to the total amount of oxi-toxicity. So, the statement regarding this issue that's contained in the working draft document is completely misleading and inconsistent with the information contained in the citations that Veena provided. Marcelo Hirschler agreed with Walter's assertions and also provided a paragraph regarding this issue. There's a hazard coming from DBDE, PBDE, HBB and HBCD and it's clear that HBCD which is non-aromatic and does not have a benzene ring is not set up to convert so easily to the dioxins and the furans. So, Veena's paragraph is very misleading and should not be in the workgroup's report. Avery Lindeman suggested that Veena should be allowed to respond but she was no longer on the phone. Chief Reinertson asked Walter to contact Veena offline to discuss this issue and then provide his comments to be inserted into the workgroup's document which will be discussed at the next meeting. Marcelo Hirschler emailed his statement regarding this issue to Walter and Chief Reinertson.

Howard Hopper explained that three workgroup members submitted information regarding firefighter toxicity and he tried to combine it into one statement. Bennett Yendrey advised that he can provide information regarding studies that demonstrate increased occurrences of multiple myeloma and non-Hodgkin's lymphoma due to exposure to HBCD-generated dioxins and he inquired why the section of the document that references such exposure is being struck. Walter responded that the workgroup already has such studies but a causal link between the materials being discussed and combustion toxicity has not been established. There's a presumption that the conditions are caused by work exposure but work exposure is very complicated. Even the EPA information regarding dioxins exposure from diesel exhaust, backyard burning, etc. does not demonstrate an association between whether or not there's a particular FR in the foam. There's no contention that the presumptions regarding a causal link between exposure to chemicals contained in FR's and certain types of cancer and other health problems are 100% valid. Walter stated that even the SF cohort for the blood serum study contained a lot of chlorine and the FR's being discussed do not contain chlorine.

- C. **Report Formatting Issues:** Howard Hopper explained to the workgroup that the AB 127 report was originally set up based on the Smoke Alarm Task Force's report that contained sections titled "Issues and Analysis", "Observations and Conclusions" and "Recommendations". Howard stated that the workgroup can cover most of the issues in the "Issues and Analysis" section. No conclusions will be reached in that section; they will all be self-contained. Vyto's paper included a number of issues that Paul identified and if the workgroup wants to capture them, then they should be brought into the "Issues and Analysis" section. The workgroup's original assertions and brainstorming items that are currently located towards the bottom of the report should also be brought up into the "Issues and Analysis" section if the workgroup wants to keep them. If nobody champions those original ideas, then they should be deleted. Chief Reinertson advised Howard to move the information and discussions regarding E84 testing down to the end of the report in a kind of "parking lot" and if the workgroup makes a recommendation that SFM should move forward with revisions to the E84 test, then the information that was discussed about that topic will be available.

D. Material Vs. Assembly Tests: Chief Reinertson advised that the issue regarding material tests vs. assembly tests was resolved earlier during the meeting because the workgroup is going in a direction that may require assembly tests; what they consist of has not yet been determined. Marcelo Hirschler disagreed and stated that the question is being framed incorrectly because assembly tests are already being done; the question is whether or not to perform both material tests and assembly tests together rather than performing assembly tests alone. Paul stated that the question should be “can we do an assembly test without a material test as part of the certification protocol?” Marcelo Hirschler stated that the title of the section should be “Assembly Test Methods With or Without Material Tests”. George Combs stated that “can do” should not be used in the section title because anything can be done. Donald Lucas assumed that an assembly test was brought into being because the simple materials test was not considered adequate thus he questions if there’s a case where an assembly test is considered less stringent than a materials test. Jess Beitel advised that the assembly tests were done because of the differences in exposure conditions and orientation. Don Lucas asked if the assembly tests are more representative of the real world. Walter stated that the material test plays a role because, as was demonstrated by the 285 with type 15 four inch foam, a material test is necessary if someone wants to create a type II assembly. Paul asked if Walter’s point was that an assembly test was done on a product that contained an insulation board that met a very rigorous E84 test performance result. The workgroup responded negatively / that was not Walter’s point. Chief Reinertson asked the workgroup if the discussion regarding materials tests vs. assembly tests adds value to the groupthink when considering Chief Hoover’s latest direction. The workgroup agreed that it does add value and added the question “are assembly tests sufficient to define fire safety?” to the report.

E. What Flame Retardants Are of Particular Concern? Chief Reinertson advised that this question was addressed during the last meeting and that the workgroup had agreed not to evaluate each FR one by one. This question may arise at a later date for a different reason but Chief Hoover’s current direction removes it from the table. This assessment is not evaluating individual FR’s; if the charge is to evaluate methods, then it’s irrespective of specific FR compounds.

F. Current Test Methods, Correct Level of Fire Safety: This goes back to the question that was discussed earlier regarding material and assembly tests. Paul referenced back to Vyto’s materials. Chief Reinertson advised to leave the data. The underlined language contains items that were caught and added to the report. Marcelo Hirschler stated that the You-Tube video regarding the NFPA 286 fire test for insulation materials is irrelevant to the discussion; there is no thermal barrier in the video, the material is not a foam and the construction is random. Chief Reinertson showed the workgroup the You-Tube video. Marcelo Hirschler stated that whether or not the thermal barrier is sufficient to prevent flaming ignition depends upon how long the fire lasts. The smoldering ignition source would be inside the wall. George Combs stated that the workgroup keeps discussing the real-world situation vs. an E84 or any other type of test that’s used and even Vyto said that there’s not one single material test that can predict real-world performance and that’s the reality of materials that are combustible. So, a material prop is going to be trying to determine some relative behavior of a material under certain ignition conditions with certain heat sources and that’s what determines if a corner test will be passed. What kind of heat flux will be applied to a material under a certain set of conditions?

Chief Reinertson advised that much of the underlying language contained in the document is brand new and was just disseminated to the workgroup members; he’s going to leave it in the report for everyone to read, digest and discuss at the next meeting.

Paul Wermer stated that the discussion goes back to the fire safety question regarding what performance criteria is the workgroup looking for? Is the time that it takes for occupants to escape being considered? Is the timeframe that the occupants believe to be a reasonable expectation of response by the FD being considered? Should that timeframe last throughout the life of a major well-fueled, well-oxygenated fire? These questions determine some baseline criteria for the tests and if the workgroup does not have information to answer those questions, then debates could arise over factors that are not germane and the tests will not accurately predict what's actually going to happen in a fire situation.

Bennett Yendrey asked if SFM has information at their disposal regarding residential construction that could be cross-referenced with commonly identified causes of residential fires that frequently occur. Marcelo Hirschler responded that NFPA has the best fire statistics which include identification of the items that are first ignited in different kinds of residential fires in homes built using various types of construction. Insulation is a non-starter and is way down at the bottom of the list. Chief Reinertson advised that kitchen fires are at the top. Tina asked what unclassified wiring is and Marcelo Hirschler responded that it's all of the wiring that isn't in one of the categories / nobody knows where it's located. Chief Reinertson elaborated upon the topic and advised that the ignition source is frequently not just the wiring itself but the wiring methods; wiring inside a junction box or a light switch. Tina stated that these types of ignition sources could not be fixed with FR's. A workgroup member advised that insulation includes wiring insulation which is mixed up with thermal insulation. Marcelo Hirschler advised that all wiring insulation in the U.S., except for wiring insulation that goes underground, is flame retardant; it's accepted as part of the National Electric Code.

G. Appendix B, Reference Documents: Large quantities of new information has been inserted into this section that needs to be reviewed and formatted for the next meeting.

H. Appendix C, Text of the Bill: The text of the bill is contained in Appendix C.

VII. ADJOURNMENT

Chief Reinertson advised that the next meeting will be held at SFM Headquarters (1131 S Street, Sacramento, CA 95811) on Thursday May 29th from 10:00 AM – 4 PM; he will email the GoToMeeting and conference call telephone line information to the workgroup members prior to the meeting. Chief Reinertson adjourned the meeting at 1600 hours.